

WAUGH (W^m. F.)

Typhoid fever.

STEWART (W^m. B.)

A Clin. Study of Sulpho-Carbolate
of Zinc.

REPRINT OF ARTICLES.

“TYPHOID FEVER.”

By WILLIAM F. WAUGH, M. D., OF PHILADELPHIA, PA.

Read before the Pennsylvania State Medical Society, June 3rd, 1891; published in *The Times and Register*, June 13th, 1891.

“A CLINICAL STUDY OF SULPHO-CARBOLATE OF ZINC.”

By WILLIAM BLAIR STEWART, A. M., M. D.

Read before the Atlantic County, New Jersey, Medical Society, September 3d, 1890; published in *The Times and Register*, October 25th, 1890.

Also report of case by WILLIAM F. WAUGH.

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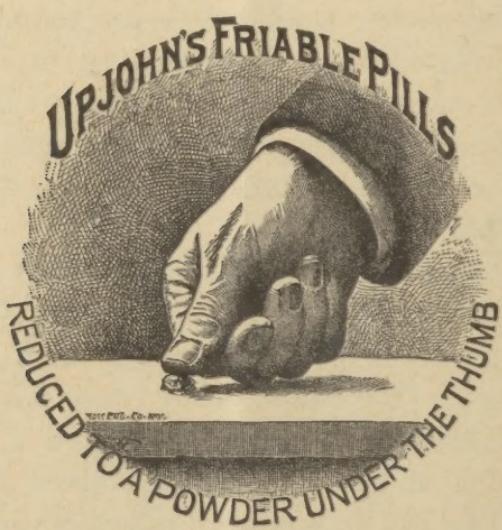
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TYPHOID FEVER.

BY WILLIAM F. WAUGH, M. D., PHILADELPHIA, PA.

Read before the Pennsylvania State Medical Society, June 3d, 1891.

I owe this society an apology for addressing it the third time on the subject of typhoid fever. But to us this is the most important of all the continued fevers, as it prevails in every part of the state. And now that so many able workers are placing their ideas before the profession, it is necessary for one who believes he has things of importance to say to speak out emphatically and persistently, or his first utterances are quickly forgotten.

In 1888 I proposed to you the treatment of typhoid fever by the administration of the sulpho-carbolates. I now lay before you the results of that treatment in one hundred cases.

PATHOLOGICAL BASIS.

The researches of Klebs and Eberth have given us the means of comprehending this disease, and of assigning a definite explanation to each of its salient phenomena, and consequently have enabled us to apply our remedies with a distinct purpose in view.

We have to deal with a specific morbific principle, a living entity, a micro-organism, entering the body occasionally through the air-passages, but almost always passing into the alimentary canal with the food or drink. Here it multiplies, and during its life produces certain phenomena that are manifested to us as the symptoms of typhoid fever. It is almost certain that these are not all due to the typhoid bacillus, but that by its operations this organism opens the way to others, and to the work of the latter we owe no small part of the phenomena observed during an attack of typhoid. For instance, while the typhoid bacillus attacks Peyer's patches, and sets up a disease therein, it seems probable that the suppuration of these patches is the work of the

ordinary bacteria of suppuration; the staphylococci, etc. These are always to be found in the intestinal canal, but their action is successfully resisted by the tissues until these have been weakened by the disease set up by the typhoid bacillus. So, also, the suppuration occurring in various parts of the body, as complications or sequels of typhoid, are probably due to this secondary infection by the pyogenic bacteria, entering the system through the door opened by the typhoid bacillus.

Moreover we know that the effects of micro-organisms in the body are often mediate; they are not caused directly by the presence of these organisms, but are produced by those substances generated in the body by the bacteria, known as ptomaines, that act as agents more or less toxic to the human body, like the alkaloids. When these ptomaines shall have been sufficiently studied, we will be able to detect their presence in the body by their effects, as surely as we recognize the action of morphine or atropine by examining the pupil. At present we can only treat of these substances in mass, and I will ask you to consider for a moment the state of the intestinal canal during the course of a typhoid fever. The fever has dried up the secretion of the digestive fluids, lacteal absorption is prevented by the disease of Peyer's patches. The intestines contain a mixture of vitiated secretions, dead and dying tissues, food that cannot be digested, the whole forming a decomposing mass in which the typhoid bacillus, the pyogenic bacteria, and a host of unknown micro-organisms carry on their work, unchecked by the forces that in health are sufficient to prevent, or inhibit their functions. Here is found the field for the employment of antiseptics, the indication being to destroy the micro-organisms, and thus prevent the production of those toxic bodies that, absorbed from the intestinal canal into the blood, give rise to a certain portion of the symptoms of typhoid fever. I say, a portion, not all, for it has been shown that even in the earliest stages of this disease the typhoid bacillus has penetrated beyond the intestinal canal and has been found in the blood. This explains why in some cases the duration of the attack is not materially shortened, for the function of the antiseptic medication is essentially local. No remedy has yet been found that can pursue the microbe in the blood, and saturate this fluid to such a degree as to destroy the

life of the bacteria in it, without first destroying the life of the patient.

RATIONAL THERAPEUTICS.

From this brief sketch of the pathology of typhoid fever, we are prepared to consider the question of therapeutics from a rational standpoint. There is no excuse now for empirical or symptomatic methods exclusively. Of these, the antipyretic treatment has had the greatest popularity, especially as regards the cold bath. This measure has been so generally employed that the cases so treated are numbered by many thousands. But we are really not agreed as to whether the fever thus suppressed is an enemy to be antagonized or a friend to be welcomed. Some have claimed that fever is Nature's means of destroying intrusive bacteria, the life of these organisms being strictly limited within certain degrees of heat. Taking it for granted, however, that fever is an evil, it is still a crude and unscientific method of treatment, to suppress this fever by applying cold, instead of going directly to the heart of the matter and removing the cause of the fever. Is it not better to clean out a dirty cellar than to seal up the openings that let the effluvia enter the house?

The only excuse for such a method of treatment is the want of a better one, and this I believe I have found in the use of intestinal antiseptics. By the production and continuance of intestinal antisepsis we put a stop to all the morbific operations going on in the bowels. The micro-organisms are destroyed, the production of ptomaines is stopped, and the symptoms of the disease are reduced to those arising from the bacilli that have penetrated beyond the reach of local germicidal agents. This enables us also to differentiate the effects due to this intestinal decomposition from all others.

INTESTINAL ANTISEPSIS.

Both before and since my paper appeared in 1888, there have been numerous applications of this principle. Calomel had been a favorite with practical physicians long before Wunderlich set upon it the seal of his approval. I do not know that George B. Wood ever explained the action of turpentine, but its effect is undoubtedly due largely to its antiseptic action, espe-

cially as it has been frequently noticed that the best effects are obtained from an old oil that has been oxidized largely. Iodine and carbolic acid were recommended by Bartholow, and iodine alone by Liebermeister. Salicylic acid, resorcin, naphthol and naphtholine have each been advocated, and each is probably of value as an antiseptic. But none of these can compare with the sulpho-carbolates, because none is so effectual and so free from objectionable features. Salicylic acid is too feeble in antiseptic power, unless given in doses so large that they cause deafness and heart-failure. Carbolic acid is too nauseous, too irritant, and if given in doses large enough to produce intestinal antisepsis is liable to cause toxic symptoms, sometimes developing very suddenly. Iodine is open to the same objections. The naphthols have been used by Bruce with good effect, but unfortunately the limit of toleration is reached before the production of antisepsis. Besides, the nauseous taste is very objectionable. Salol unites the disadvantages of its constituents, but in a less degree than either. It is, perhaps, better than any of the preceding agents, but is not nearly so powerful as the sulpho-carbolates.

In the sulpho-carbolate of zinc we have an agent that is singularly free from objectionable qualities. It is inodorous, almost tasteless, easily retained by a delicate stomach, and the most powerful antiseptic I have ever introduced into the alimentary canal. I have given 5 grains every two hours for weeks without noting any ill-effects. Much less than this suffices to fully disinfect the intestinal canal, in fact, 2 grains every four hours will usually deprive the stools of all unpleasant odor. At first I gave the drug only in powder, with an equal quantity of bismuth, but latterly I have been using a keratin-coated pill. This keratin-coating was introduced by Unna, who claimed that this substance is insoluble in the gastric juice, and will thus carry the drug, undiluted, past the stomach into the intestines, where, meeting the alkaline secretions, the coating will be dissolved and the drug exercise its full force where it is most needed. This, however, has been pretty surely disproved, and I find that acids dissolve the coating of these pills in a test-tube quite readily. The pills, however, are easily taken and fully as effectual as the remedy in powder. My rule is to give $2\frac{1}{2}$ grains

every two hours, until the stools lose their offensive odor, then to continue the same dose often enough to prevent the return of the odor. I regret that I have no more scientific means of regulating the dosage, but this answers all practical purposes.

EFFECTS OF THE SULPHO-CARBOLATES.

Since 1888 I have used this drug in every case of typhoid fever treated by me. These cases, excluding those in which the diagnosis was not certain, and those in which the sulpho-carbolate was not employed until a late stage, number over one hundred. All of these recovered. All the doubtful cases recovered. The number and proportion of abortive cases treated by me in the same period, and not included in this list, were very large. The specific effects of the drug upon the symptoms were as follows: The fever fell from one to two degrees as soon as the stools became inodorous. This has been an invariable effect, and, as this fall brings the case out of the limits recommended by Brand as suitable for the cold bath treatment, this result alone would warrant us in the use of the sulpho-carbolate.

The diarrhoea ceased within twenty-four hours, or was reduced to a minimum. In fact, constipation generally ensued, and we were compelled to use enemas or salines to keep the bowels open, so as to secure antisepsis of their whole extent.

The tympanites borborygmi disappeared, the abdomen became flat.

Intestinal hemorrhage occurred but once, and that in a case where the disease had nearly a week's start before the sulpho-carbolate was commenced.

The headache and delirium passed away with the fall in the fever, and did not reappear.

Now, all these effects followed with such unfailing regularity that I am compelled to believe that the symptoms mentioned are all due to the absorption of ptomaines from the intestinal canal.

In addition, I would say that the course of the disease has been nearly always shortened, that complications and sequels have been practically unknown.

If you will admit that one who has studied this fever with interest for twenty years has learned to recognize it somewhat

earlier than he can demonstrate it by such unquestioned symptoms as the rash and the fever type, I will state that very many abortive cases have occurred; where, even after a threatening beginning the sulpho-carbolate has dissipated the attack in a week or less. How do we reconcile this belief with the statement that the typhoid bacilli have been discovered in the blood, beyond the reach of remedies, in the earliest stages? It must be remembered that there is also a constant breeding of these bacilli going on in the intestines during the progress of the disease, and it is a fair supposition that, if these are destroyed, the forces of the system will prove sufficient for the destruction of the few that first entered, probably by phagocytosis.

LIMITATIONS.

As to the limitations of this remedy, I have not employed it for three years without learning that, like a certain brand of soap, there are some things it will not do.

In cases where I have been called late into the case, or where the antisepsis has not been perfect, no miracles are wrought by the zinc. If the intestinal ulcers are extensive, if hemorrhages have occurred, or when Wood's signs of impending perforation are present, turpentine is a better remedy, although I usually give the zinc also. Ataxy and cardiac failure demand their own remedies; the zinc is valueless to cure these conditions, inestimable as a preventive. Such cases should not be counted as failures of the method, then, as its function is not that of a panacea against the whole Pandora's box of ailments that accompany a typhoid. Its function is sharply defined and limited, but when used with a clear idea of its function it renders these dangerous accidents impossible.

ABORTIVE TYPES.

In order to illustrate my remarks upon abortive cases, I select one from my note-book:

A young girl had passed through a severe attack of unmistakable typhoid fever. Her mother, who had never had this fever, nursed her through it. The hygiene of the house and of the room were poorly attended to. Some time after the mother

was seized with headache, aching of the bones, insomnia, broken and disconnected dreams, slight cough irritability of the bowels, tympanites, borborygmi, colicky pains, gurgling and tenderness in the right iliac fossa, tongue showing a tendency to dryness down the center, and slight epistaxis. Here was enough to justify a diagnosis of incipient typhoid fever; but, under the sulpho-carbolate, the patient recovered in three days.

A more pronounced case was that of a medical student, whose temperature had mounted up in the regular way until it had reached 103.6° the third evening, and 102.5° the next morning, when the zinc was commenced. That evening it was 102.5° , the next 102.8° , the next 102° , the next 100.8° , and thereafter it did not rise above 101° at any time during the remainder of the attack. This lasted in all twenty-three days, when the temperature reached the normal point. In this case the spots were plainly visible.

I have scarcely anything to add to my remarks in 1888 upon the diet of these cases. My reliance is still upon the raw white of egg in ice water, beef peptonoids, or raw beef with bovine, and absolutely nothing else. Milk I scarcely ever use in typhoid fever, except in the form of junket, or peptonized milk. Alcohol does not enter into the treatment of one-third of my cases; not that I have any prejudice against it, but simply because I do not need it.

The stools are carefully disinfected before being thrown into the sewer.

Numbers of other physicians have adopted this treatment, and their experience has confirmed me in the belief, that we have in the sulpho-carbolates, agents of unusual value in the treatment of typhoid fever.

A CLINICAL STUDY OF SULPHO-CARBOLATE OF ZINC.

BY WILLIAM BLAIR STEWART, A. M., M. D.

Read before the Atlantic County, New Jersey Medical Society, Sept. 3d, 1890

For many years diseases of the gastro-intestinal canal, as well as those of other organs, were treated empirically, but at the present day, with our knowledge of bacteria as an etiological factor, we are enabled to strike directly at the seat of the trouble, in many cases, and treat on scientific principles. It is not my intention in this article to review the whole field of anti-septics, nor to enter into a discussion of the intestinal antiseptics in general, but I wish to direct the attention of the profession to some of the results that have been obtained from the use of sulpho-carbolate of zinc. My attention was first directed to this drug in the fall of 1887, and, since that time, I have had an opportunity of studying its action in the treatment of affections of the gastro-intestinal tract and other organs.

WHAT THEN IS SULPHO-CARBOLATE OF ZINC.

Sulpho-carbolate of zinc is a new unofficial salt, prepared by the action of a concentrated solution of barium sulpho-carbolate on zinc carbonate, by which sulpho-carbolate of zinc is formed.
—Remington.

Properties.—It is a crystalline, transparent salt which is permanent in air. It is neutral in reaction, and has no smell. It has a taste somewhat bitter and cooling as well as astringent. It is soluble in water and alcohol and gives a perfectly clear solution. When heated moderately the water of crystallization is thrown off and a white powder remains. When a higher degree of heat is applied, inflammable fumes are given off, which emit the odor of carbolic acid, and a white tasteless residue remains. With this brief reference to the drug, its preparation and properties I will pass to a consideration of its therapeutic effects

without entering into further details as to its chemical and pharmaceutical history.

Under the head of summer diarrhoea we find a class of maladies that often prove to be intractable and fatal under the ordinary forms of treatment, but now much can be done to effect speedy recoveries in many cases, and to diminish the mortality by the intelligent use of this valuable remedy—sulpho-carbolate of zinc.

Investigation has shown that most forms of summer diarrhoea are due to the irritation caused in the alimentary tract by certain disease germs, and their ptomaines which are developed in undigested and fermenting food. Bearing this in mind, many cases can frequently be relieved by a dose of aromatic syrup of rhubarb, or a dose of oil to stimulate the intestines to throw off the offending material. The main principle to be considered is that of *elimination*, for so long as the poisonous matter remains in the bowels, we have a focus from which the trouble will spread, and no amount of antiseptic medicine will render it inert. However, it is not to these mild cases that I refer, but to those in which the ordinary cathartic will not bring relief.

Given, a typical case in which a child is vomiting, has pain in the stomach and bowels, with a high fever; what is the condition, and what are the indications for treatment? The whole trouble is traceable directly to the intestinal canal which is swarming with micro-organisms and, what is worse, their ptomaines. These germs, by their action, are a source of irritation to the intestinal mucous membrane, and also cause a fermentation and decomposition of the food or fluids which, with the ptomaines and secretions cause the fetid discharge. What then happens? The absorbents take up the septic matter and ptomaines and throw it into the circulation, and, by this, we can account for the fever and constitutional symptoms.

Purgation has been sufficiently free, and the child is so sick that nothing in the nature of a strong dose could be retained on the stomach, and, again, it is necessary to stop the violent drain on the system as soon as possible. The line of treatment is now evident, and what is wanted is a remedy that will be carried to the intestinal canal and kill the germs, neutralize the ptomaines and stop fermentation. The cause once removed, the constitu-

tional symptoms would subside. It is almost impossible to find a remedy that can be administered in quantities sufficient to accomplish this result without endangering the life of the patient, but there is one remedy that can be given in efficacious doses, and that is the sulpho-carbolate of zinc.* To a child two years old I would give R.—Zinc sulpho-carbolate, gr. 1-4; bismuth subnit., gr. 1, every two hours, increasing the sulpho-carbolate at every dose, if necessary, until two grains would be given at one dose. As the symptoms subside lengthen the interval for administering the medicine. If the first dose is vomited persist every fifteen minutes or longer until a powder can be retained. If administered in this way, the first change noticed is in the vomiting, which is almost immediately checked after the first dose. The fermentation of the food is checked and the pain subsides as a consequence. After a few doses have been taken the fever and constitutional symptoms subside, the stools lose their odor, become less frequent and assume a normal condition. Sometimes the diarrhoea and fever do not subside under this treatment because the ptomaines and germs are active in the lower bowel and cannot be reached by the mouth. In this case, make a solution of five or ten grains of the sulpho-carbolate to the pint of hot water and use freely at regular intervals as an injection. Do not be afraid to fill the bowel full of the solution or you may not obtain the desired result. In addition to this treatment, as in treatment of all other diseases, it is necessary to regulate hygiene and diet and meet the other complications as they arise, with the appropriate remedies. Good nursing is half of the battle.

There are those who advocate the use of other remedies, and, in some cases, undoubtedly obtain good results; but many times when we come to consider the rationale of their treatment we meet with great obstacles. Undoubtedly good results have been obtained from the use of other combinations, and I have found it so in my own hands, but it is well to have a variety of remedies from which to select, and this one is worthy of a high place in the catalogue.

*I do not wish to be quoted as saying that the intestinal canal can be rendered entirely aseptic, but the sulpho-carbolate will come as near producing this condition as any other remedy.

A germ is a germ, whether in a man or a child, and it will take as much medicine to kill it in the one as in the other, except that we find a proportionately larger surface of mucous membrane in the adult. Bichloride of mercury has its advocates; but it is found that a dose sufficient to render the intestinal canal aseptic would kill or seriously endanger the life of an adult. Again, it forms albumenate of mercury, which is not antiseptic. How much less would this remedy be applicable in children? "Hydronaphthol has been used by an English physician as an intestinal antiseptic; but a limit of tolerance was reached before it rendered the intestines aseptic." (Waugh). Others claim that this salt is innocuous. (*Therap. Gazette*, Aug. 15, 1890, p. 544.) It, as well as beta-naphthol, is not efficient or suitable in children. Salicylic acid and the salicylates are too irritant to the mucous membrane of the bowels, and are unpleasant remedies in children. Salol is a valuable remedy and most excellent results are reported from its use.

As to the merits of the sulpho-carbolate of zinc; It has been given in fifteen grain doses to an adult without causing any symptoms of irritation or unpleasantness, and one case is quoted by Dr. W. F. Waugh, of Philadelphia, where sixty grains in one day gave no unpleasant or toxic symptoms. Why then is the zinc salt preferable to the officinal sulpho-carbolate of soda or sulpho-carbolic acid? Phillips, in his work on *Materia Medica*, in speaking of the sulpho-carbolates, says: "The administration of these salts, however, offers an indirect method of giving carbolic acid These alkaline compounds, however, have less local irritant action, and up to the present time have not caused poisonous symptoms." (Page 866). Dr. Cerna (*Medical Times*, Vol. X. p. 209) sums up his article on the sulpho-carbolates as follows: "1. The sulpho-carbolates possess* toxic properties for cold-blooded animals. 2. In warm-blooded animals these salts are innocuous." The zinc salt is more or less astringent, and has a better action on the mucous membrane of the bowel, and is a nerve stimulant, while the sodium lacks this virtue. The zinc salt also acts more like small doses of arsenic and copper, the virtues of which have been well established.

Again, Potter (*Therapeutics*, page 396) says of the zinc salts: "They manifest a much less tendency to accumulate in the sys-

tem than the other metallic salts, and are excreted much more rapidly. Elimination takes place chiefly by the liver and intestinal glands." Zinc acts also as a nerve tonic. The general supposition was that the zinc sulpho-carbolate was not fit for internal administration, and for this reason it has been slighted by our authorities in its consideration; little space and attention being given to it. The pure sulpho-carbolic acid could not be given on account of its obnoxious smell and taste, as the little ones would rebel against it.

In the administration of germicides, the first principle to be observed is to give enough to destroy the germ without endangering the life of your patient. During the past two summers it has been my privilege to treat a great number of cases of summer diarrhoea and cholera infantum without the loss of one case, and my mainstay has been the sulpho-carbolate of zinc. I will mention two cases from my clinical record.

CASE I.—Martha J., aged 10 months, was seized with violent vomiting and greenish diarrhoea. Nothing would remain on her stomach, and she was unable to retain any nourishment. There was some fever, pulse was high and the child was very restless, it was bottle-fed.

R.—Zinci sulpho-carb	gr. 2 ¹ / ₂
Lacto-peptine	gr. 12
Bismuth subnit	gr. 18

M. ft. chart No. 12

Sig.—One every two hours until relieved, then increase the interval and give as necessary to control the bowels.

The above prescription was ordered and instructions in regard to diet were given.

From the first dose the child began to improve, and in two days had completely recovered. The zinc salt acted as an anti-septic, anti-spasmodic and astringent; the pepsin as a digestant, and the bismuth as a sedative and astringent. During the remainder of the summer the child had several severe attacks, but was promptly relieved by the same treatment.

CASE II. Mr. James G., a laborer, was seized with violent vomiting, cramps and fetid diarrhoea. I found him in bed, very weak, nervous and restless, and still inclined to vomit every-

thing he attempted to swallow. He was given a powder containing two grains of the sulpho-carbolate and two grains of bismuth, to be repeated every two hours. He improved from the first dose. Nausea ceased, pains disappeared and after the fourth or fifth powder the diarrhoea ceased. He slept soundly that night and was put on a tonic, and in a few days was able to resume his duties in full.

I could cite many cases of similar character that have come under my care, and in every case the same uniform good results have been obtained.

I wish next to call your attention to another property of this agent, viz., its employment in combination with purgatives and other irritants (local) of the alimentary canal for its sedative effects. The griping produced by cathartics may often be measurably overcome by combination with the sulpho-carbolate of zinc. I have found it of especial value where a slight astringent action is desired in connection with cathartics, to prevent too free and active purgation. Ordinarily it acts very nicely in this combination and is worthy of your attention. It answers very nicely to take the place of the opiates which are so frequently used with purgatives. A short letter received from Dr. T. S. Blair, of Chambersburg, Pa., will give a good idea of its use in this connection. He writes:

"In reference to the use of sulpho-carbolate of zinc, I would say that, aside from its usual purposes, I have employed it in acute summer diarrhoea and as a corrigent in various cathartic preparations in general use. For the common bilious attacks of adults I usually write as follows:

R.—Hydg. chl. mit	gr. 4
Podophyllin....	gr. $\frac{1}{2}$
Zinci Sulpho-carb ..	gr. $1\frac{1}{2}$

M. et. ft. chart No. 3.

Sig.—One at 6 P. M., one on retiring and, if necessary, the third powder in the morning.

"The above is very efficient in severe cases, and the zinc prevents largely the griping and nausea produced by the podophyllin. Owing to its astringent and antiseptic qualities, the salt is especially applicable in summer diarrhoea, and I usually exhibit it in a combination as follows:

R. Hydg. chl. mit.....	gr. 5
Pulv. rhei.....	gr. 15
Zinci sulpho-carb.....	gr. 3

M. et. ft chart No. 3.

Sig.—Take in rice-paper wafer, same as in last R.

"This is for an adult. I find this mixture an admirable purge for general purposes, and have particularly noted its power of rapidly reducing fever due to indigestion or congestion of the bowels. I have used it a score of times in cases where a good purge was necessary and the patient could not leave his business. It produces the minimum of nausea and yet proper efficiency. In many cases I reduce the quantity of Hg. For children I usually prescribe the proper quantity of blue mass or mercury and chalk, in place of calomel; but a slight increase over the ordinary dose is required, owing to the astringent quality of the sulpho-carbolate." * * * *

Dr. Boardman Reed, of Atlantic City, N. J., kindly contributes a few lines in relation to his experience in the use of this remedy: "A delicate child was brought here from a western city in the early part of the present summer, suffering with chronic intestinal catarrh, which seemed to be a sequela of la grippe. It was a baby of about a year old, and though it was having only three or four slimy stools a day, was already considerably emaciated. After trials with various other remedies the child was placed on the sulpho-carbolate of zinc, one-quarter grain doses, combined with one grain of lacto-peptine after each feeding. Half a teaspoonful of castor oil was administered once in two or three days, to clear out the bowels and cod liver oil was rubbed into the skin every day. The result was quite satisfactory. The stools gradually became fewer in number and of better quality. In a course of a month after this treatment was instituted the mucous had almost entirely disappeared from the stools, and the latter were beginning to be formed.

"I have used this drug in numerous other less stubborn cases of intestinal flux, and nearly always with satisfactory results. It combines the properties of a mild but apparently active germicide with those of an efficient astringent."

All modern investigation and research point to the fact that typhoid fever is due to a distinct germ, which finds its habita-

tion in the intestinal canal—confining its attacks to the mesenteric glands and the patches of Peyer. Prior to the discovery of the bacterial origin of this disease treatment was symptomatic, and the best and most successful remedies that were then used empirically, were those that we now know to act as germicides. In addition to the actual use of antiseptics we must also bear in mind the fact that there are remedies that can arm the body against the invasion of disease germs by rendering the body an unsuitable soil for their growth and development.

Without entering into a discussion of the merits and demerits of the old and well tried methods of treating typhoid, I wish to present the clinical results or the use of the sulpho-carbolate of zinc in this disease. I am one of the firm believers that typhoid, in its first stages, is a localized disease manifested by constitutional symptoms due to the presence of micro-organisms that are inhaled or ingested with food or drink. These germs flourish and grow, and, at first are confined to the stomach, when in an unhealthy condition, and upper bowel; later the lower bowels are attacked, and so great becomes the action of these germs that the system can no longer withstand them, and, as a consequence, their ptomaines are absorbed; great depression supervenes and frequently death. With this brief review of the etiology of typhoid, the rationale of the use of the sulpho-carbolate becomes apparent, as in the cases of diarrhoea.

I have seen many cases that presented the typical symptoms of incipient typhoid, which were aborted by the administration of two-grain doses of the sulpho-carbolate of zinc every three or four hours for the first few doses, and then lengthening the interval. Dr. W. F. Waugh reported thirty-four cases of typhoid fever which he treated with the sulpho-carbolate of zinc, and did not have a case in which perforation, hemorrhage or grave nervous symptoms ensued during the use of this drug, as was the case with other remedies. Every case recovered. He gave three grains every two or three hours in a little water and noted that the stools soon became normal and lost their odor; diarrhoea was checked, tympanites subsided, the stomach became quiet, the temperature became one or one and one-half degrees lower, and the delirium and stupor subsided. No antipyretics were needed, but in some few cases where the heart was weak stimu-

lants were necessary. Bovinine, thickened with the white of an egg, constituted the best diet.

The great secret in the use of this, as well as all other anti-septic remedies, is to begin its use early in the course of the disease, and to use it persistently and in doses sufficient to render the alimentary tract as nearly aseptic as possible.

I have received a very interesting letter from Dr. W. G. Stewart in relation to the use of this drug, and it is worthy of a passing glance. It reads as follows:

"In December, 1888 and 1889, I treated seven cases of typhoid fever in one family, all well marked and nicely defined cases of that disease. The general and leading symptoms were confined principally to the bowels—most of the cases having swollen and tender abdomens, with some hemorrhage. Temperature ranged from normal to 105° F. I treated these cases with the sulpho-carbolate of zinc, pepsin and opium. I gave the zinc in one-half to three grain doses every two, three or four hours, as indicated and according to age. Everyone of the family recovered promptly with no unpleasant sequela. The zinc salt is an invaluable remedy in all well defined cases of typhoid fever and should be given in all stages of the disease for its antiseptic properties, and as a guard against hemorrhage.

In 1889 I treated about seventy cases of infantile diarrhoea and cholera infantum with the sulpho-carbolate of zinc, pepsin, bismuth and opium. The zinc was given in one-quarter to one grain doses every three or four hours, and with a uniform good result in every case.

"In August, 1889, a man of about forty-five years, called to see me who was suffering with the regular 'bloody flux.' I gave him three grains of the sulpho-carbolate of zinc with one-half grain of opium every three hours. In twenty-four hours he was entirely relieved and resumed his regular duties on his farm.

"In January, 1890, was called to see a man of seventy-two, with hemorrhage from the stomach, vomiting blood in large quantities, and was in a very weak and reduced condition. I at once gave him five grains of the sulpho-carbolate of zinc in a wine-glass full of water, which stopped the vomiting and all hemorrhage. The zinc was continued in three grain doses every

four hours, and my patient has now entirely recovered, and has had no symptoms of any return of the hemorrhage.

"So far in the summer of 1890, I have used this salt in about forty-five cases of diarrhoea and cholera infantum and have obtained the same results as before. I am fully satisfied that in the sulpho-carbolate of zinc we have a valuable remedy, one on which we can rely with confidence. In all, I have treated over one-hundred and fifty cases with this drug, and in *no case have I regretted the selection of the remedy.*"

Dr. George Grove, of Big Spring, Pa., a physician who has practiced medicine for more than fifty years, writes that: "From the first dose of sulpho-carbolate of zinc, with bismuth and opium combined, in two cases of typhoid fever in the third week, the irritability of the stomach was relieved and the stools lost their fetid odor in twenty-four hours' time. I then gave cinchonidia every four hours, and in eleven days my cases needed no more attendance. These were cases of typhoid abdominalis. Regarding the diarrhoea of children, I think it is the *rem tendere* (or the thing intended.)"

Every drug will be used in some cases where it will not accomplish the desired result, and so with this one. A case just now comes to my mind where a physician used the sulpho-carbotate of zinc in a bad case of typhoid fever. The case was that of a young man aged twenty-two years. He had a high temperature, and blood stained stools. The sulpho-carbolate was given, but in spite of all treatment, perforation and profuse hemorrhage supervened and the patient died. Now it is altogether possible that the sulpho-carbotate was not used early enough in this case, and not in sufficient doses to accomplish the desired result. When typhoid, like all other diseases has assumed a malignant form, in which the blood is disintegrated and the whole system depressed, it cannot be expected that this or any other remedy, can repair the damage which has been done, death alone can end the scene.

I am unable to learn of any authentic cases of Asiatic cholera or yellow fever in which this remedy has been given a fair test, but I believe it is well worth a trial in these affections. owing to its astringent, anti-spasmodic and antiseptic properties, it seems to me that if the remedy were given boldly and in large

doses (five to fifteen grains) every few hours, at the outset of these troubles the disease might be checked or greatly mitigated in its severity. This drug does not possess the same astringency as that found in the sulphate of zinc, but it will act much better locally in many cases, and, having in addition the antiseptic properties, is preferable.

By using from two to four grains of the salt to the ounce of water we have a very good injection for gonorrhœa, leucorrhœa or gleet. In an article written by Dr. J. William White for the *Medical News* (June 14, 1890), he refers to the use of a combination of corrosive sublimate and boric acid in the treatment of recent anterior urethritis. He then says: "I felt, however, the additional need of an astringent, and for a long time employed the sulphate of zinc, for which I have recently substituted the sulpho-carbolate (two to ten grains to the ounce of the mixture). By using a ten to fifteen per cent. solution of peroxide of hydrogen as a menstruum, I then found that I had a formula, which, both clinically and experimentally, showed excellent antiseptic qualities. In exceptional cases of profuse catarrhal secretion the addition of bismuth salicylate was also of advantage."

It is also very valuable as a lotion in discharging wounds and mucus surfaces. It has been used in balanitis with success. In the London Throat Hospital ("Wood's Medical Formulary," page 382) it is "used topically as a stimulant and antiseptic. R.—Zinci sulpho-carbolate, gr. 5; distilled water, fl. oz. 1. M.—used by means of spray apparatus. Used in secondary syphilis of the larynx and pharynx."

Phillips (*Therapeutics*; page 866) speaks of its use in scarlet fever. "In twenty-nine cases, some extremely severe with suppression of rash and convulsions, all recovered except one (a syphilitic baby). Convalescence was most complete in seven to fourteen days. No topical treatment was practiced, and Dr. Sansom fairly concludes that by the sulpho-carbolates the duration of the attack was shortened, the pyrexia lessened, and the throat symptoms especially benefited." Sulpho-carbolate of zinc is also used with benefit in the vomiting of pregnancy, with small doses of calomel.

Thus far, in my consideration of the sulpho-carbolate of zinc, it has been used in combination with bismuth. and the

question that naturally presents itself is: Whether the action is obtained from the bismuth or the sulpho-carbolate? I have used it alone in treating diarrhoea, and have obtained very satisfactory results. It has been used by other practitioners, and at present some of our leading pharmacists are putting up the drug in the form of a tablet containing from one-half to two grains. It has been found, by my experience at least, that the sulpho-carbolate will act better in bowel complaints if combined with bismuth or pepsin. Any one of these drugs will act nicely alone in many cases, but, by their combination, we have a much more reliable and active prescription.

This constitutes the main portion of the literature now extant in relation to the use of sulpho-carbolate of zinc, and in summing up the whole subject, entirely from a clinical standpoint—not a theoretical one—I am more than ever convinced of its usefulness and value in summer complaints and septic fevers.

I am very forcibly impressed with the saying, "Never be the first by whom the new is tried, nor yet the last the old to lay aside." It is the duty of every practitioner in medicine to seek and search for those remedies that will afford prompt and permanent relief all "pathy" being laid aside; but it is not well to take up every new remedy that may be recommended by this, that and the other man, unless a scientific and practical reason can be given for its use. *Clinical experience* in the use of drugs is the best way to decide their usefulness, and, no matter how plausible the theory may be, we must be guided by it in their use. The medical value of the sulpho-carbolate of zinc and the sulpho-carbolates has been sufficiently demonstrated at the bedside and in the clinics to firmly ingraft them among the stable remedies at the hand of every practitioner.

Authorities consulted.—Works on *Materia Medica and Therapeutics*, by H. C. Wood, Potter, Phillips, Brunton, Waring, Bartholow, Napheys, U. S. Dispensary, Remington's *Pharmacy*, *Medical Times, TIMES AND REGISTER, Therapeutic Gazette, Medical News.*

ATLANTIC CITY, N. J.

THE SULPHO-CARBOLATES IN INCIPIENT TYPHOID FEVER.

The value of the sulpho-carbolates in incipient typhoid fever, may be illustrated by the following case, one selected out of many:

A young girl had typhoid some months ago—a typical case, severe, from which she recovered. Some time thereafter her mother, who had nursed her through her fever, was seized with the following symptoms: Headache, aching of the bones, insomnia, broken and disjointed dreams, slight cough, bowels irritable, tympanites, borborygmi, colicky pains, gurgling and tenderness in the right iliac fossa, tongue showing a tendency to dryness in center, and slight epistaxis.

Now, was this not sufficient to justify a diagnosis of incipient typhoid fever, occurring in a house where this disease had prevailed a short time previously? I certainly thought so; and felt myself justified in putting the patient upon the use of the sulpho-carbolate of zinc.

Dr. Upjohn had just sent me several thousand pills of this salt, containing $2\frac{1}{2}$ grains and 5 grains each. I gave the patient one of the latter every two hours until the stools were disinfected; then substituted the smaller pills, given at the same interval. The symptoms were relieved almost from the first dose, and in just three days the patient was discharged from treatment, all typhoid symptoms having disappeared.

The case is described because the probability of its being typhoid was almost a certainty. But many other cases have occurred in my practice in which the diagnosis of incipient typhoid was the only one that could be made; and yet the symptoms soon passed off under the use of the sulpho-carbolates. This good result occurs so constantly that I no longer expect failure to abort an incipient typhoid, when the sulpho-carbolate of zinc is given promptly, before the typhoid bacilli have penetrated beyond the intestinal canal. I may add that the five grain pills did not produce any gastric irritation whatever, either in this case or in any one of a number of others of incipient and confirmed typhoid fever.—*Waugh.*

PILL FERRUGINOUS COMPOUND.

Having from time to time had inquiries for a Blaud's pill with the addition of some bitter tonic, also with the addition of sufficient amount of some mild laxative to overcome the constipating effect of the Iron Protocarbonate, we now list as follows :

PILL FERRUGINOUS, COMPOUND WITH ALOIN.

R—Iron Sulphate dried, $1\frac{1}{2}$ gr.
 Potass. Carb. $1\frac{1}{2}$ gr.
 Quinine Sulph. $\frac{1}{2}$ gr.
 Aloin, 1-10 gr.
 Ext. Nux Vomica, 1-10 gr.

PILL FERRUGINOUS, COMPOUND.

R—Iron Sulphate dried, $1\frac{1}{2}$ gr.
 Potass. Carb. $1\frac{1}{2}$ gr.
 Quinine Sulph. $\frac{1}{2}$ gr.
 Ext. Nux Vomica, 1-10 gr.

These, like our regular Blaud's pills, are made in a manner that will insure the Iron salt being presented as Iron Protocarbonate when administered into the stomach.

The addition of Quinine $\frac{1}{2}$ gr. as a bitter tonic and Aloin 1-10 gr. as a laxative, will certainly recommend these formulæ where such additions are indicated.

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We judge of our success by the very substantial encouragement received from the professions of medicine and pharmacy, and the rapidly increasing demand for our line.

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Respectfully,

THE UPJOHN PILL AND GRANULE CO

FERRUGINOUS, (Blaud's) 3 grs.

{ Iron Sulph. dried 1½ grs.
Potass. Carb., 1½ grs.

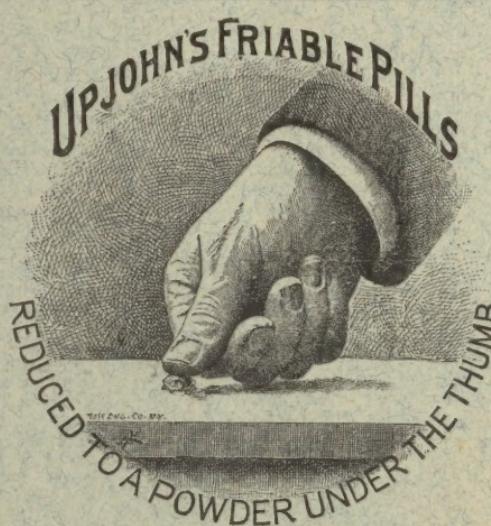
FERRUGINOUS, (Blaud's) 5 grs.

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A pharmaceutically perfect Blaud's Pill should contain Iron only in the form of Proto Carbonate. A pill wherein the iron has become oxidized to a ferric carbonate is not therapeutically speaking in a perfect condition.

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**FERRUGINOUS,** (Blaud's) Modified, 5 grs.

{ Iron Sulph., exsic., 2½ grs.
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Arsenious Acid, 1-10 gr.

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Arsenious Acid, 1-60 gr.

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Potass. Carb., 1½ grs.
Ext. Nux Vomica, 1-10 gr.

Our Blaud's Pill contains the Proto Carbonate of Iron in a nearly pure state and is so protected by an impervious but freely soluble coating as to remain in this condition. We will take pleasure in submitting samples to any who may wish to give them a trial.

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[with ALOIN 3½ grs.

{ Iron Sulph., 1½ grs.
Potass. Carb., 1½ grs.
Quininé, ½ gr.
Ext. Nux Vomica, 1-10 gr.
Aloin, 1-10 gr.

FERRUGINOUS COMP., 3½ grs.

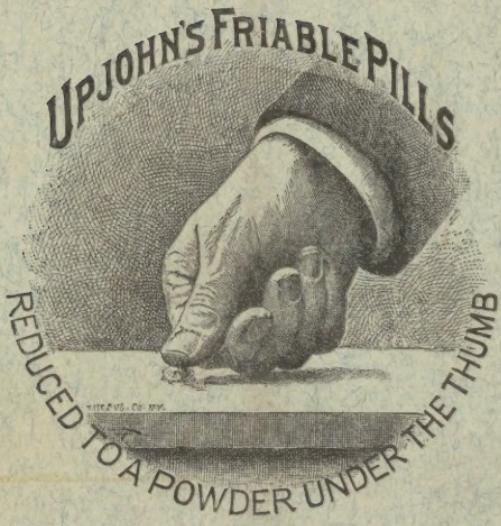
{ Iron Sulph., exsic., 1½ grs.
Potass. Carb., 1½ grs.
Quinine, ½ gr.
Ext. Nux Vomica, 1-10 gr.

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